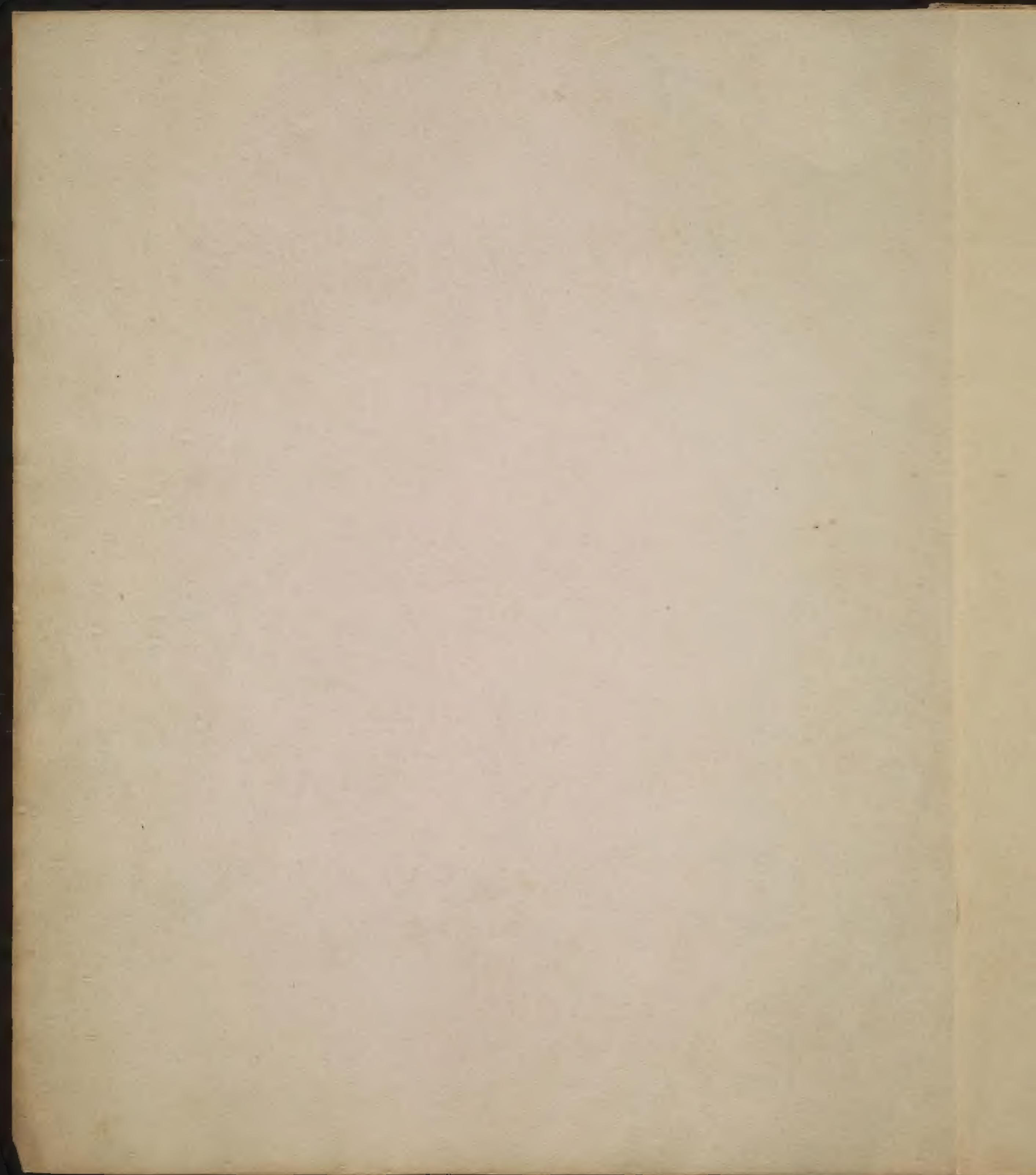
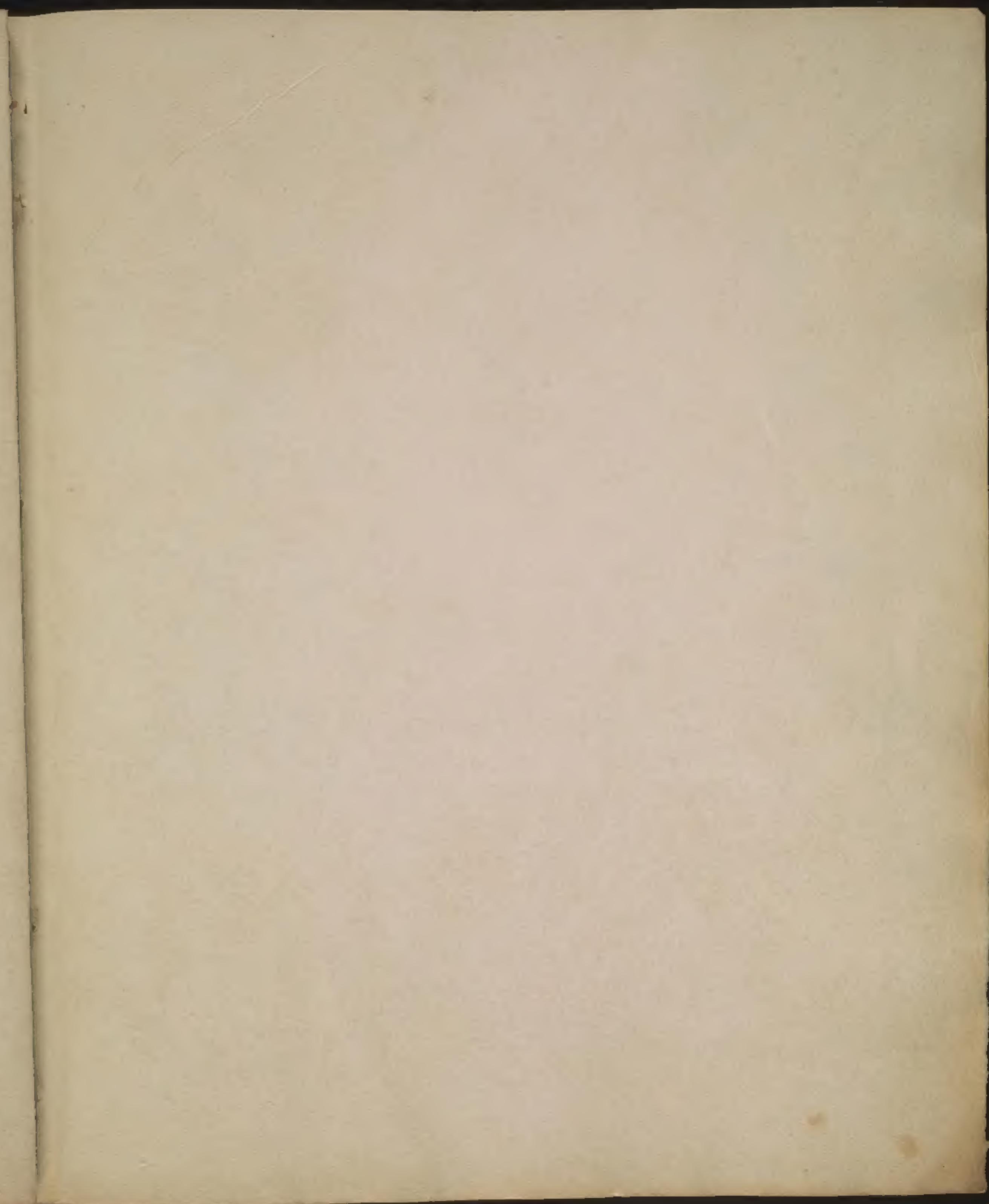


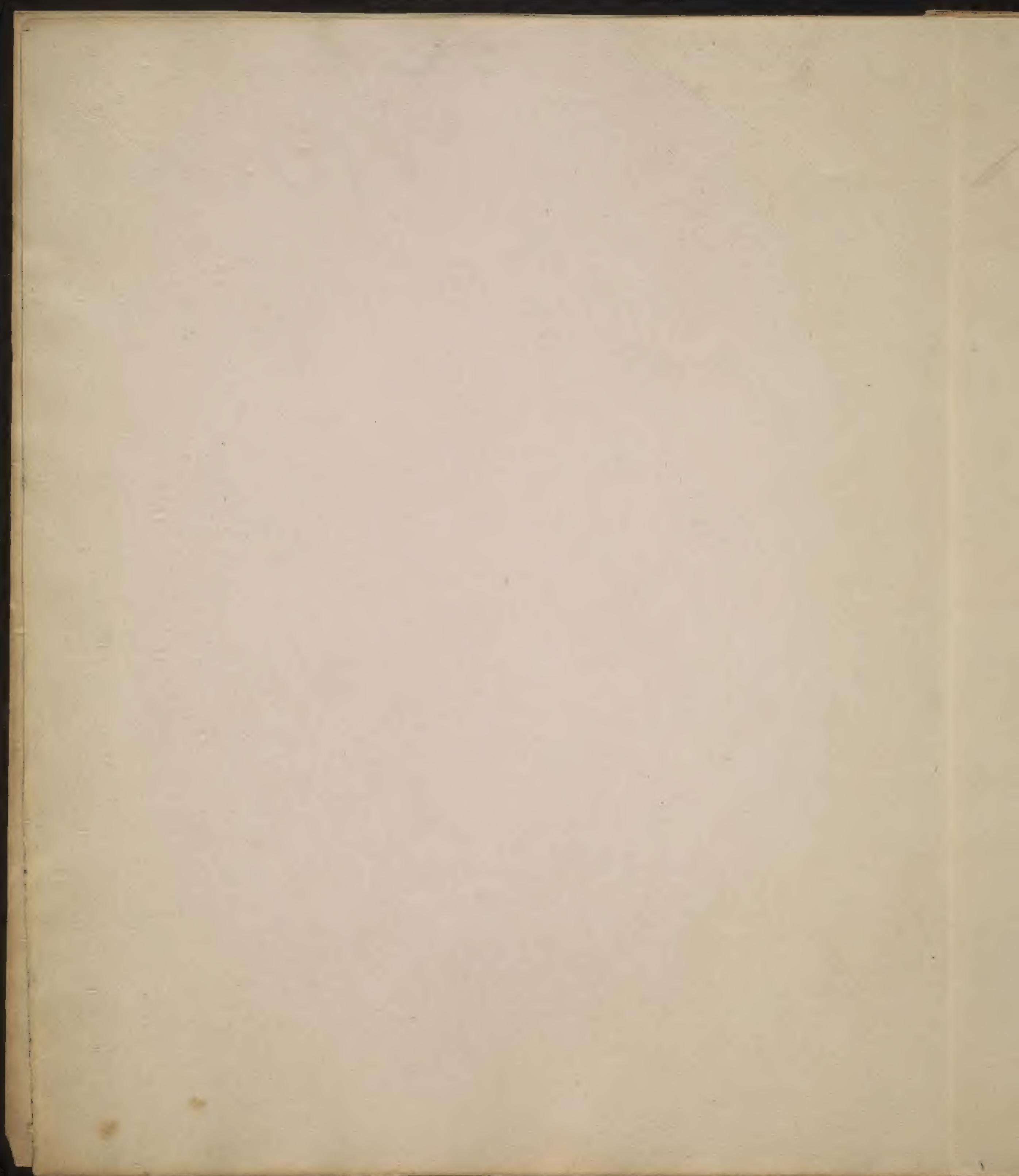
Mr
Essay on
The Modes Operando of Gold
By
Samuel Mervy
of Virginia

We think our fathers fools, so now we grow;
Our wise sons, no doubt, will find us so.

" — " "



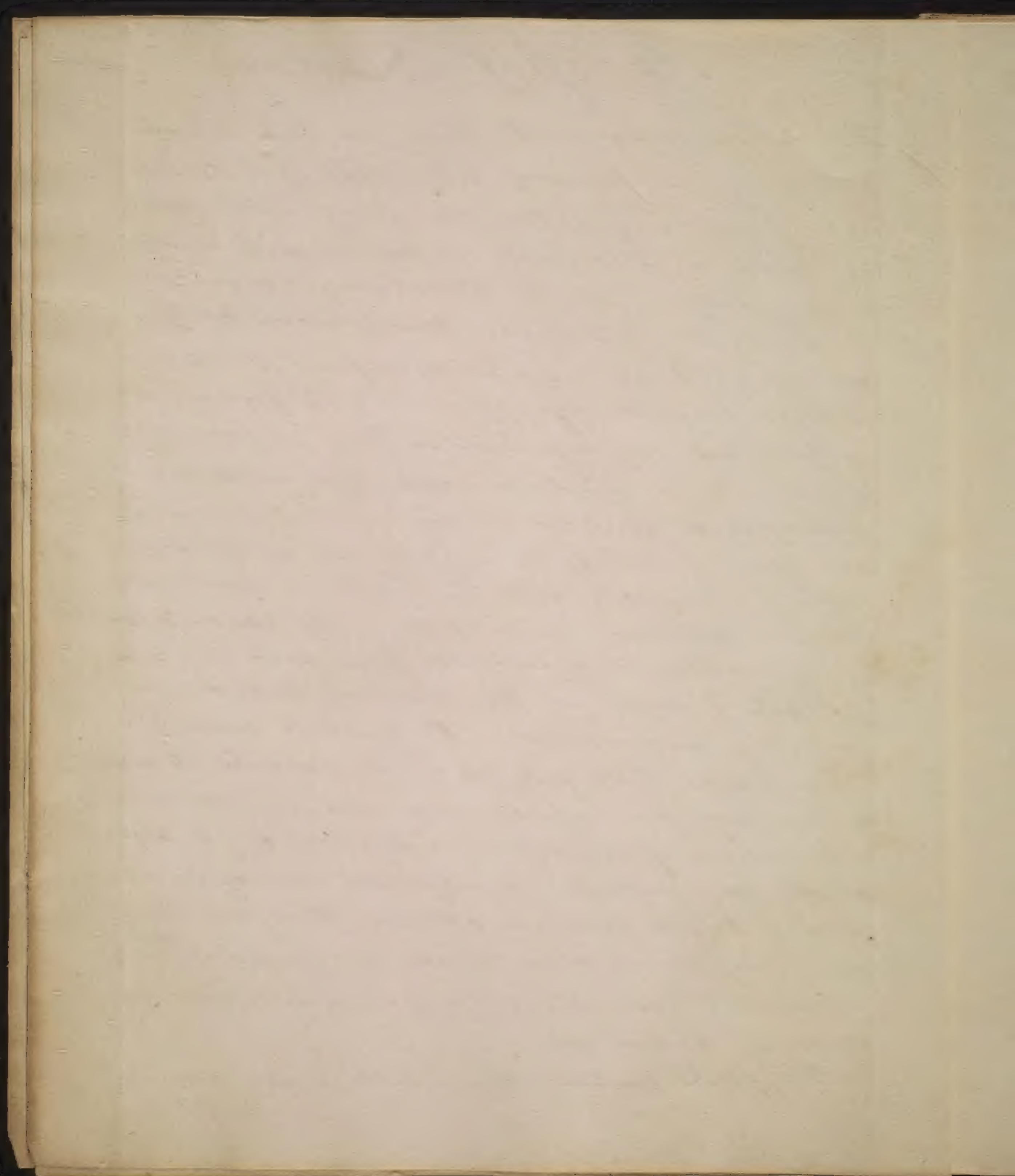




An Essay on Cold 1

For a few years past, there has been much controversy in opinions with respect to the medical properties of Cold; one party believing that it acts as a stimulant to the animal machine, & prescribing it for its stimulating power in the Treatment of diseases; while another party, considering it as a sedative, employs it with intentions diametrically opposed to the former, & in Diseases very dissimilar in their nature or stages. As no correct Practice can result from principles & intentions so discordant, it becomes an object of the first importance in the science of Medicine, that the Truth be investigated, & soon detected, since Cold in its various modes of application & exhibition forms such an important & useful ^{article} of the Materia Medica, when correctly administered. It must be evident to every person, that if it is a stimulant, it must be an improper remedy in diseases of great morbid action of the arterial system; & if a sedative, an improper & deleterious remedy in diseases of weak morbid action. Therefore that we may know when it will be beneficial, ^{when} and detrimental, we should be acquainted with its mode of Operation.

The first question then which would naturally present



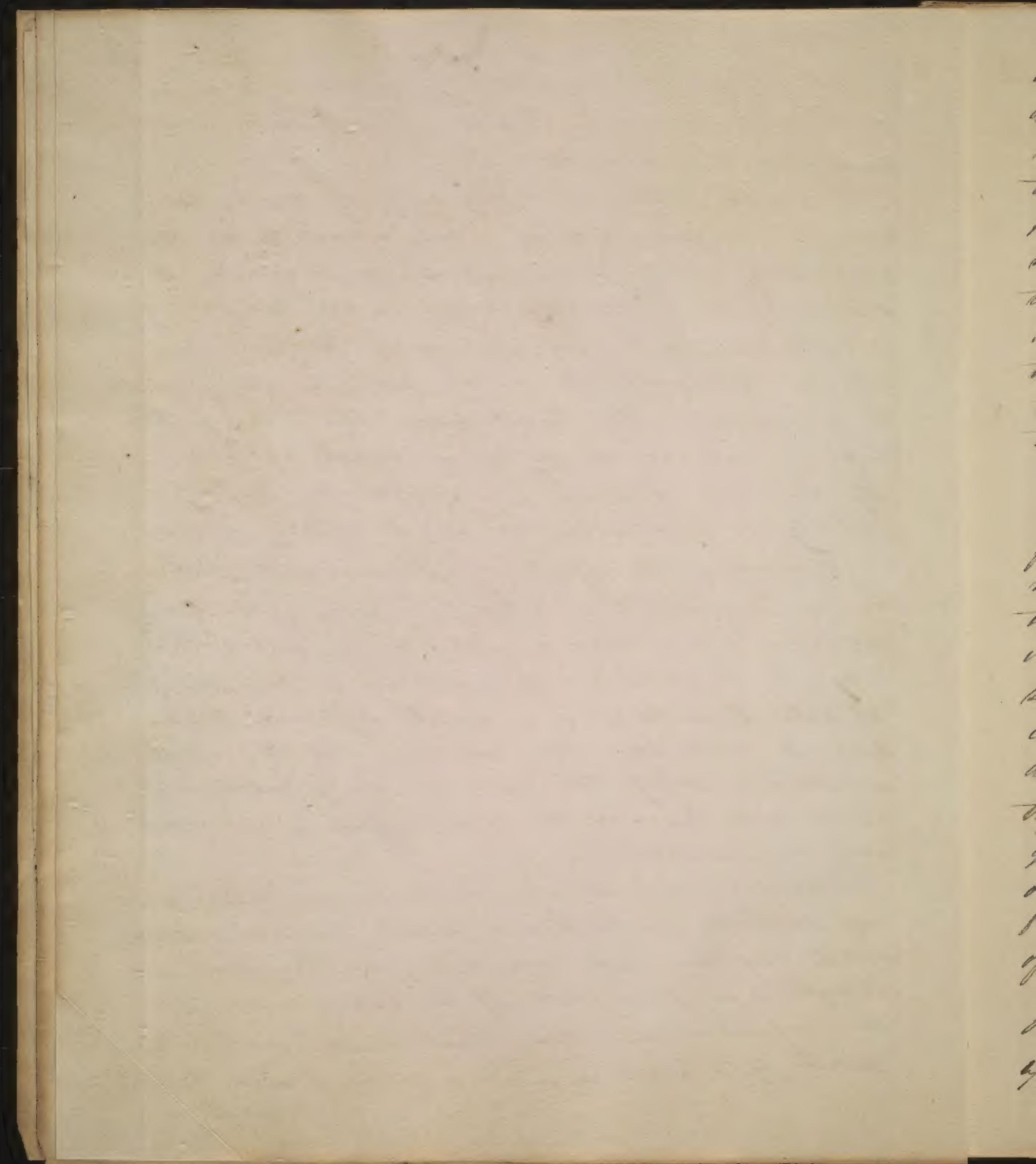
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present itself to our mind, is, whether Cola is a Stimulant or a Sedative? I shall answer that it is a Sedative.

As much confusion, & difficulty of comprehending a writer's meaning, have arisen from the ambiguity of the terms which he may use, I shall define Stimulants merely in the language of Dr. Bectow, to be any substance, property, quality or circumstance which increases the frequency & force of the circulation, the heat of the body & nervous energy by a direct action.

By Sedative, I mean any substance, property, quality or circumstance which directly reduces or diminishes the effects of Stimulants, that is to say, reduces the force & frequency of the circulation & diminishes or abstracts the heat of the body, or in other words, any thing which can abstract stimuli, or is a direct opposite. I also add to what have been denominated the direct sedatives & confess that there are many substances which will produce the above effects in a secondary or indirect manner.

Stimulants have been defined by several authors to be any substance which produces Motion, sensation & thought; & that any thing which produces Motion, sensation, and thought, is a Stimulant. If they has intended in their definition, that these effects must have been produced by a direct or primary action, I could find no objection.

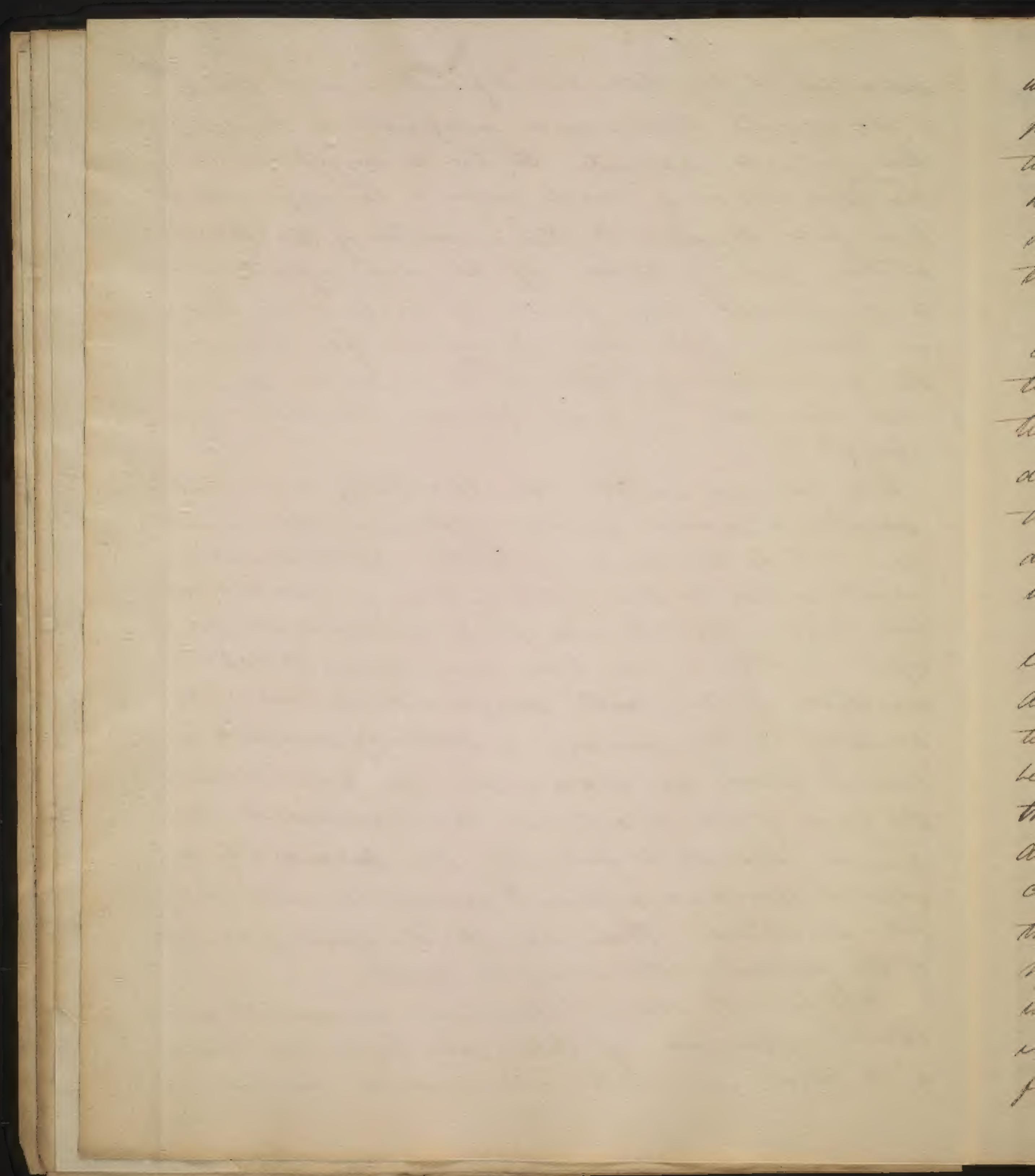


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submitted to it; but the definition as it stands, is too general, ambiguous & indefinite, & I might have added, incorrect. It has in my opinion, laid the foundation of much error & has afforded a principal argument to the advocates of the stimulating power of cold. If the above definition were to be allowed, there would be no such a thing in Nature as a direct sedative; for where is the sedative which extends to a certain degree, that does not produce Motion, Sensation or Thought?

Every one will admit that blood letting is a direct sedative, & produces sedative effects upon that animal from which the blood is abstracted; but who is so ignorant as not to know that if it be extended to a certain degree, that it will produce the most powerful Motion, & we have every reason to believe, sensation of the most disagreeable nature? The correctness of this remark is strikingly illustrated in animals which are bled to death. We first observe the force of the circulation to be diminished, the general strength to fail, but this succeeds by violent & convulsive motions & constitutes the most painful sensations. These are all the effects of the want of the natural stimulus of the blood.

Who has not observed the most disagreeable sensations experienced by those who have been bled only to such an extent as to produce syncope, or who



who has not experienced themselves the most unpleasant sensations, from the loss of such a quantity of blood as to produce fainting? No one will hesitate in saying, that the above mentioned sensations were not produced by the direct action of a stimulant.

Again, if an animal be placed under the action of an air pump, & the air be whirled, we shall observe the same effects as just mentioned concerning the loss of blood; yet no one will deny that the whirled air is a stimulant to the said animal, or that its abstraction or re-inhalation is a sedative or abstracter of stimulants.

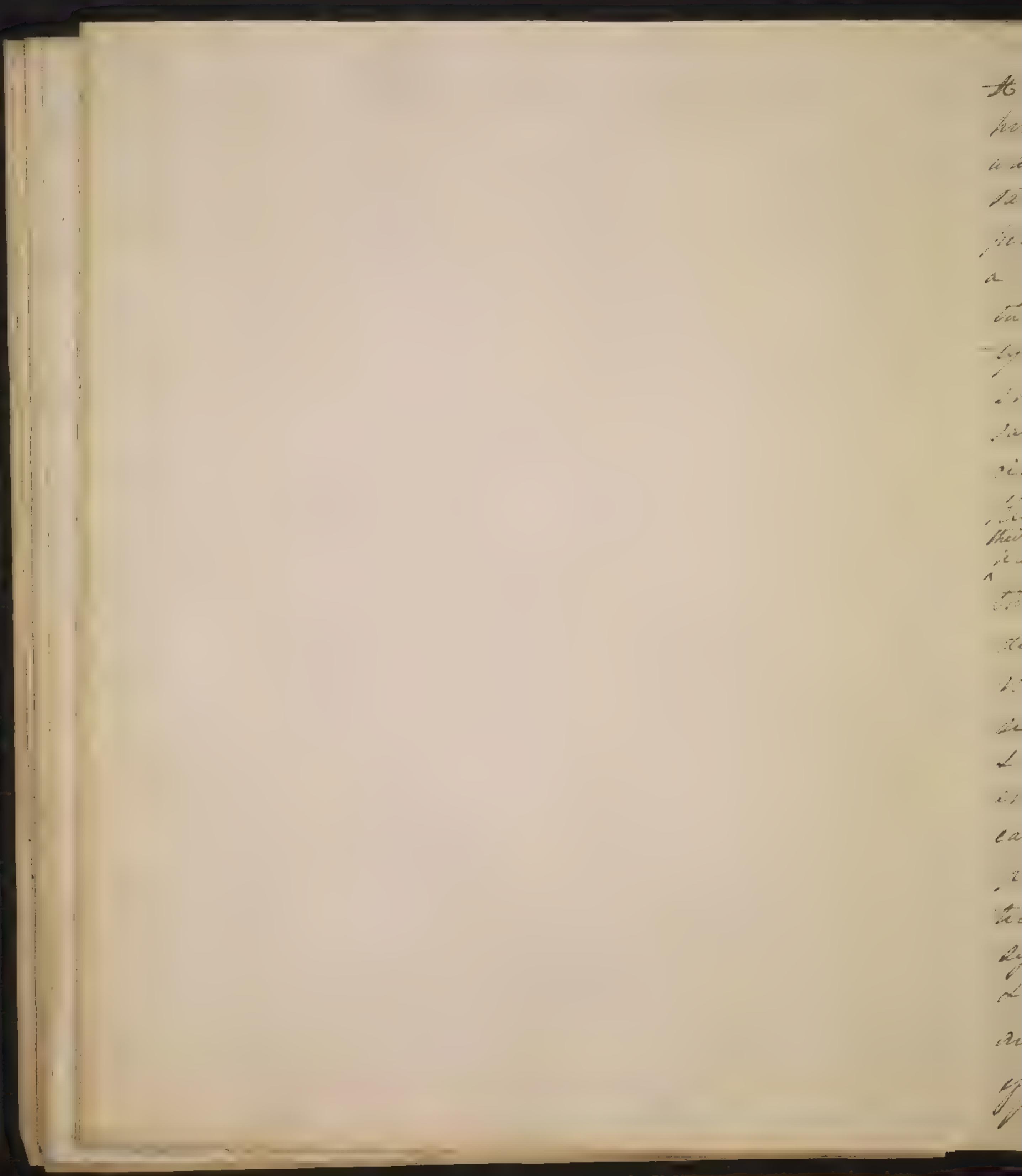
The fact which we daily observe, affords a large portion of the stimulus necessary for the animal economy;— it is certain that if the quantity or quality of this be diminished, its effects must be diminished in the same ratio, that is to say, that atrophy is a depletor or sedative to the animal system in reducing the force of the circulation, the heat of the body &c. in proportion to the degree of the atrophy. But if this atrophy be continued in degree or becomes what we call, fasting, we shall find that a morbid excitement will take place, the whole system for a short time propelling the natural strength, and



and accompanied with the most painful sensibility. The power of Hunger is so strong, that it is said to submit to no laws, or yield to no restraint. It is a familiar observation of Military characters, that the greatest courage becomes weak, nay by fatiguing. The strength of the arm is said to be much increased by hunger, it becomes more forcible.

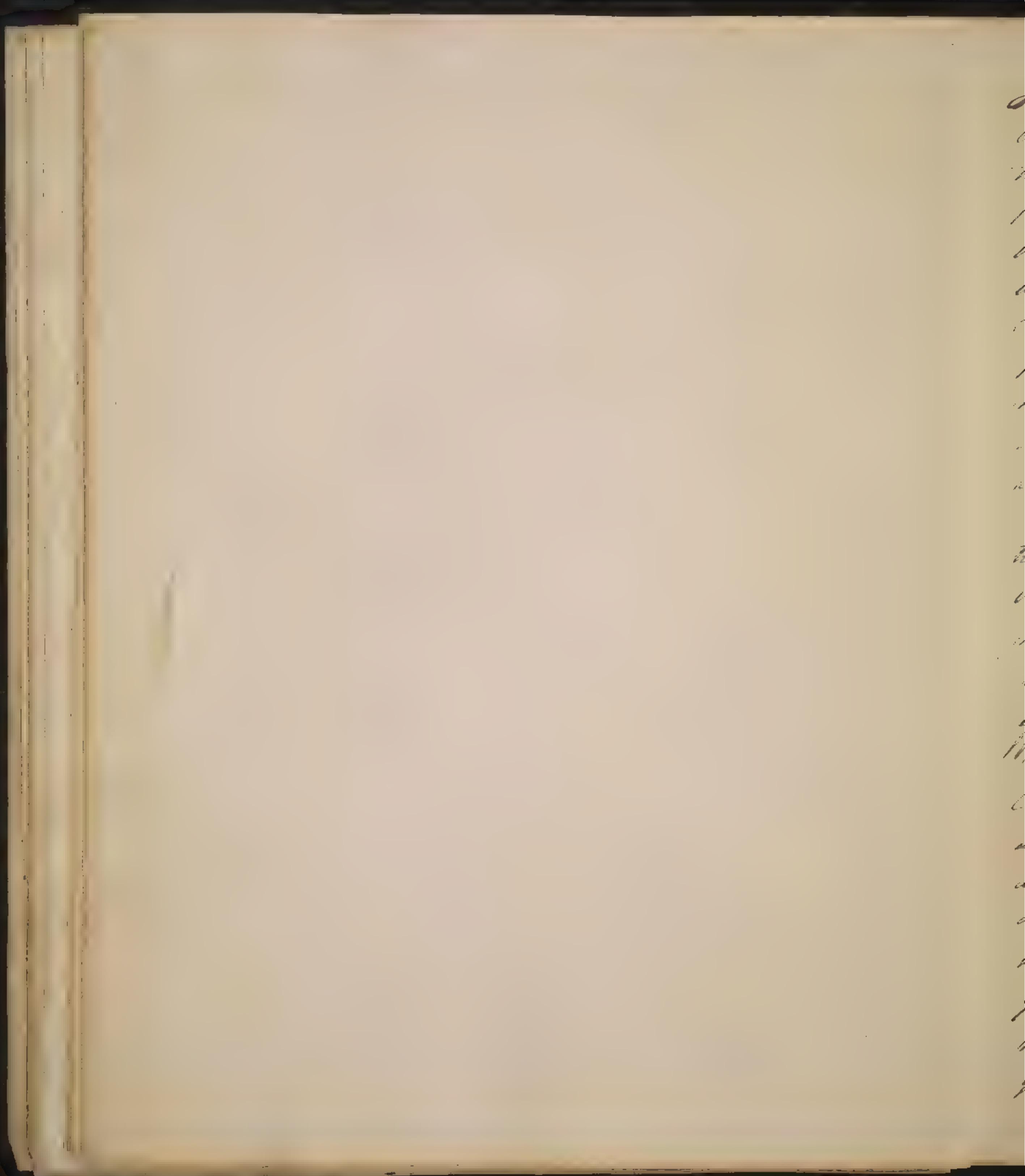
It is not reasonable to conclude that the sensation of hunger from the application of heat, are produced in this same manner from a deficiency of Stimulus, when we reflect that heat is only the cause of a deficiency of heat, or a want of capacity for heat, & that heating is a stimulant. The same phenomena take place with respect to every other sensation in nature if they be examined for enough. —

From the above facts we see that destruction & destruction are as much the effects of a deficiency of the natural & natural quantity of Stimulus, as they are of the direct action of Stimulus. It would appear from hence, that the animal economy requires a certain proportion & quantity of Stimulation for the performance of its healthy operation, & that an excess or deficiency of Stimulus are equally deleterious, & usually productive of morbid actions.



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It must not be understood that I think they produce these effects in the same manner; but while the Stimulants produce motion & sensation by a direct & specific action, they are produced by sedatives in an indirect way, or by a want of any particular or specific action of their own. For instance, when a large quantity of blood, or any other unproper stimulus is abstracted from the body, the motion & sensations found arising are the effects of a deficiency of Stimulus, or to use the words of Dr. Rush, are produced by the nerves being diverted from natural action by a deficiency of Stimulus. In this manner, I think it is evident, that a quantity of cold, or any other sedative, produces motion & sensation, & have consequently been considered Stimulants, when in fact the sensation & motion are the effects of a want or deficiency of Stimulus. As the blood in the above case is undoubtedly a stimulus to the different parts of the body, so in proportion to its abstraction must the stimulation or excitement of the system which is produced by it, be diminished, & consequently the motion & sensation which are thus produced, cannot possibly be the effect of Stimulants.



I have said above that we have more abstract
m's of stimulus, or direct irritation, & shall now say
that I believe that they are all negative agents,
properties or qualities, & produce no specific action of
their own, by acting upon the irritability of stim-
uli, which are supposed to do. Constriction, Abstinence,
etc &c, which are acknowledged to be ~~readiness~~,
produce no positive or specific action, but act
negatively by abstracting stimulus from the body & thus
diminishing or reducing the excitement in proportion
to the ~~true~~ abstraction.

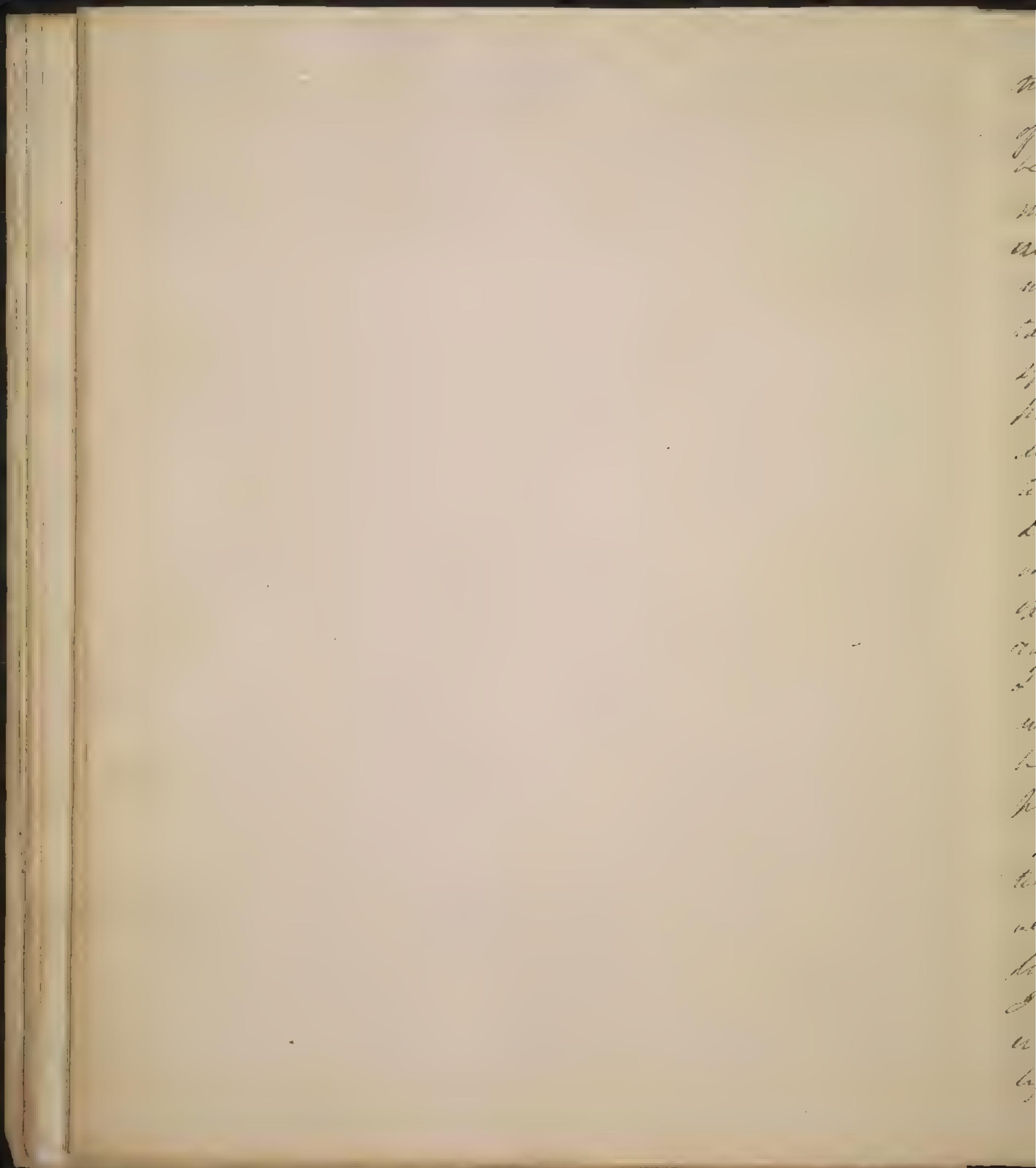
We know that cold is only the absence, or abstrac-
tion of heat, & consequently a negative property or pow-
er & can possess no positive action of its own, but
must ^{act} negatively only, by abstracting or diminishing
heat & thus remove the effects of heat, or what
effects contrary & different from those of heat. If
heat be a Stimulant (which is admitted by everyone)
cold is the absence or abstraction of heat, must be a
deator, & must have deative effects in proportion
as it diminishes the stimulating effects of heat, by
abstracting the stimulus heat itself. That I may
be ~~understood~~ more clearly understand, suppose that
90 degrees of heat be applied to the system &
produce 40 degrees of excitement; now if 45 de-
grees of cold be applied, or the heat more cor-
rectly



strictly speaking, be reduced 45 degrees, the ex-
citements must be reduced in the same propor-
tion, that is to 30 degrees, & so in proportion to
the reduction of the heat or the application of
the cold. will be the reduction of the ex-
citements.

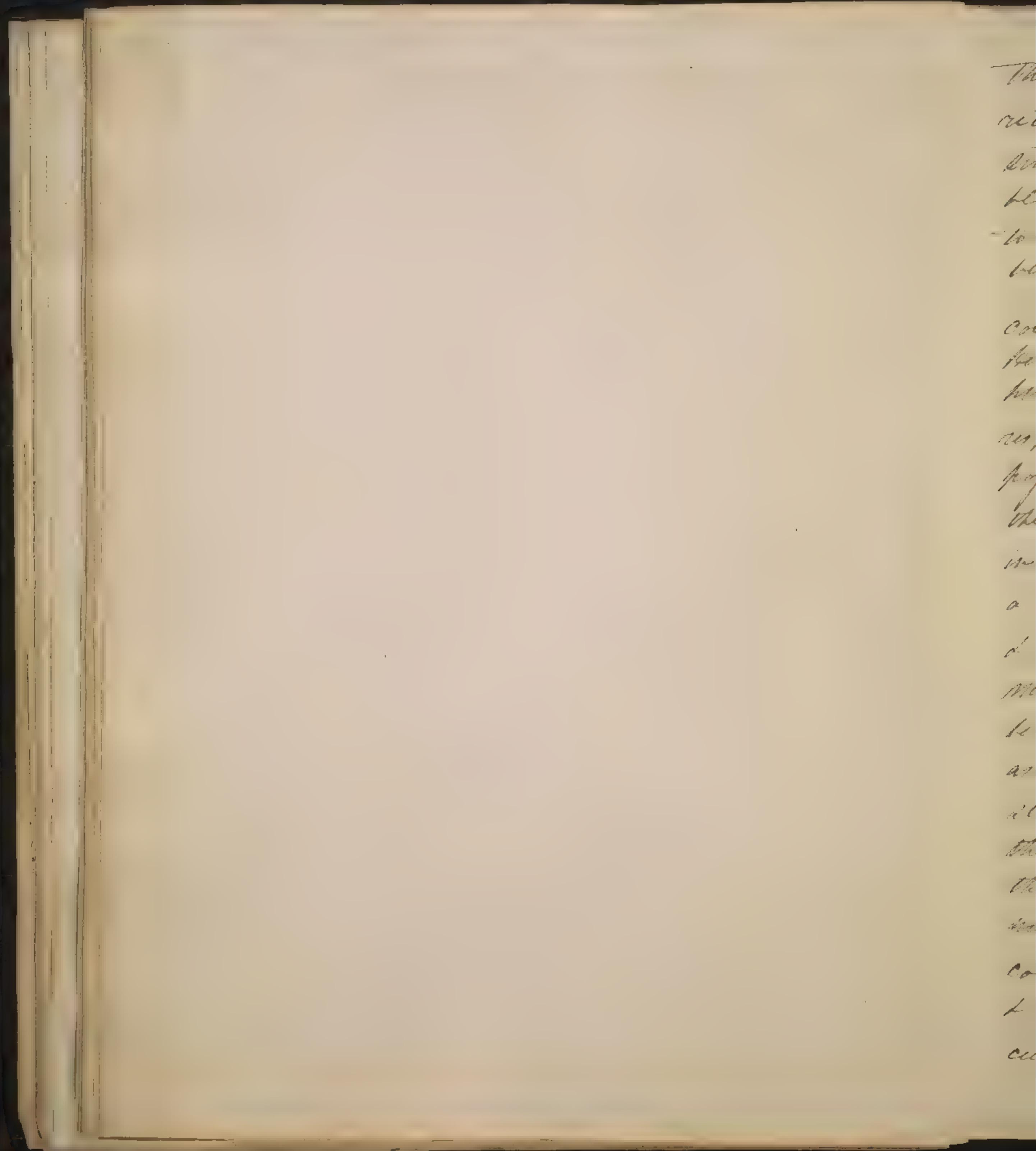
To obtain a correct knowledge of the operation of
cold, I think it would be sufficient only to take
a view of vegetation in the winter & the spring.
What causes the lifeless appearance of vegetation in
winter, & what the lively round of Spring? - no
one will pretend to say that the former is caused
by the stimulative operation of cold, or the lat-
ter by the sedative power of heat. we daily
see life excited in vegetables in its most perfect
& vigorous state, by means of a stone room or a
warm house, in the winter season, when there
are not the smallest symptoms of vegetation
in similar plants which are exposed to the
cold of the winter.

If the branch of a tree should find its way
into a stone room while the whole tree is in
a vigorous & lively state with respect to growth
& vegetation in the warm season, it will re-
main in this state for a considerable length
of time after every other part of the tree exhibits
not



not a single sign of vegetation is conserved of the winter's cold. Or should this branch be introduced into a warm stove room in the midst of winter when there was not the smallest sign of vegetation in my part of the tree, we shall find that the branch will soon vegetate & become as green as it is in the midst of spring, when the rest of the tree which is subject to the cold remains in the same condition as when it was subject to the introduction of the branch into the warm stove room. Likewise when vegetation is in a vigorous state in the midst of winter, if the temperature of the atmosphere be considerably diminished, the rapid growth of vegetables is immediately checked, & if the cold be continued for a short time, they will become pale & languid. This fact must be familiar to every one, & the cause must be as plain & as evident as the fact is familiar.

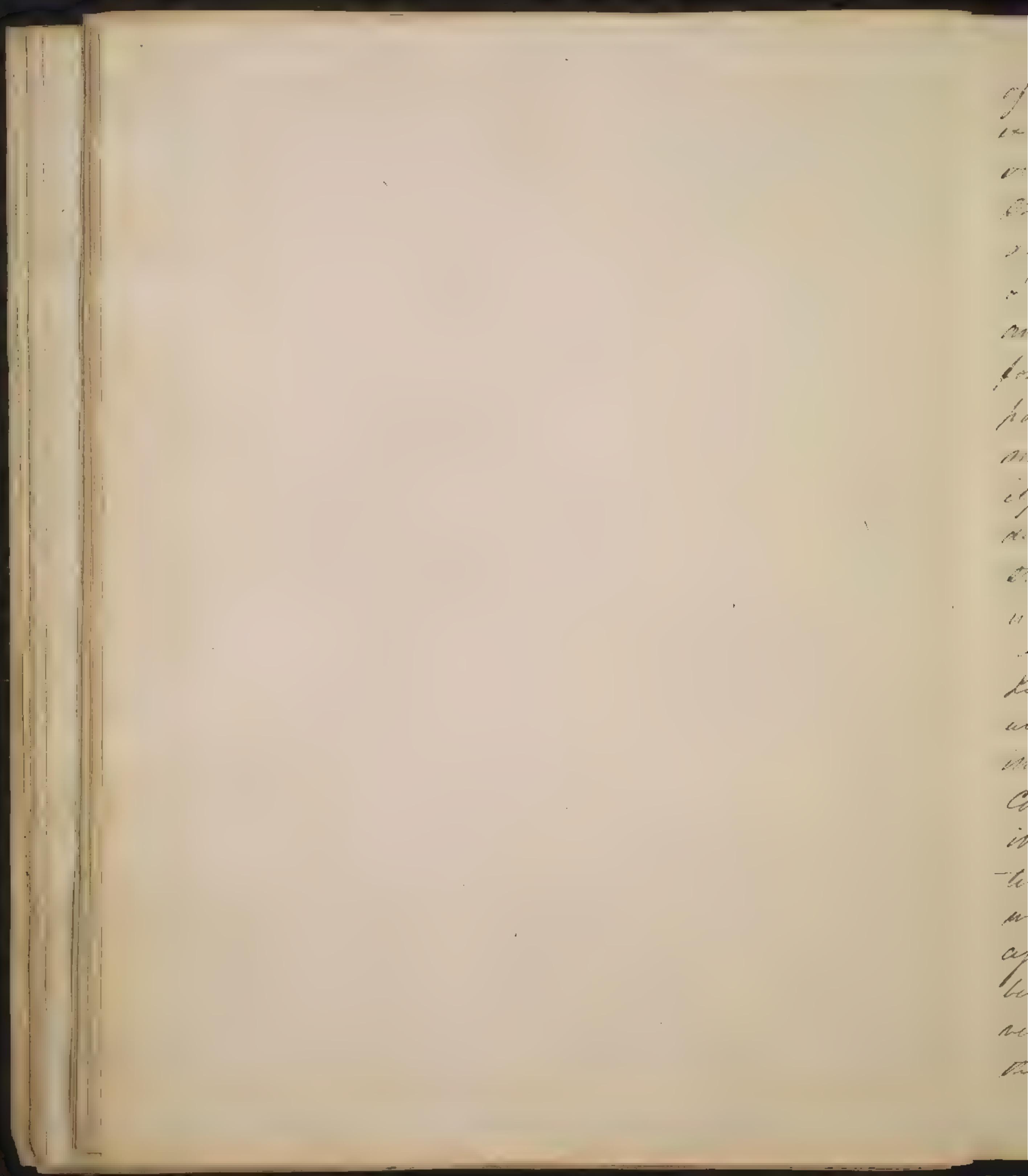
From the above facts, I think it is incontrovertibly proved, that cold cannot exert any annihilating power upon vegetables; but where is the line of distinction between vegetables & animals? I believe that Naturalists & physiologists generally agree, that they possess the same kind of life, & that differs only in degree or quantity. If this



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This opinion be correct, the most natural & correct inference would be, that Cold must exert a similar influence over animals as over vegeta-
bles, & consequently could not be a ~~benificial~~
to animals as it is unquestionably not to vegeta-
bles.

Let us next take notice of some of the effects of
cold, when applied to different insects & animals.
Now we observe the same phenomena in the
hibernating insects, animals, &c which take blood with
respect to vegetables in the different seasons. They
possess life in its most perfect & active state in
the warmer seasons, but gradually become more
inactive & torpid as winter approaches, till next
a synthon of life arrives. If in this torpid
& apparently lifeless state, they be exposed to a
moderate heat & this gradually increased, they will
become reanimated, & in a short time possess life
as active & as vigorous as they did before their
state of hibernation. But if on the other hand,
they be suddenly exposed to a great degree of heat,
that life which they possessed in a torpid state
will certainly be destroyed. It is evident that the
cold of the winter is the cause of this torpidity,
& the annual heat is naturally the cause of the suc-
ceeding activity. Cold in producing this state



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of tokeh, and either do it by shortening the excitability by means of its way of stimulating how-
ever I having the system in a non-excitable or
dormant state, & must act as a sedative by
absorbing the excess of natural stimulus of heat,
& consequently excitement, leaving the system in
an excitable or latent state. If it were in the
former way, it is plain that I would require a large
portion of stimulus, ^{to excite} it, or to crowd into it all
the remaining small portion of excitability;
but contrary to this we know that if a quan-
tum of heat be applied, we see a risque of de-
stroying the life of the insect, had a animal to
which it is applied.

A fact stated by Dr Bush in the course of his lectures you far to prove that cold is not a stim-
ulant to Hairs, so that it is sustained by experiments
it is a fact familiar to the Farmers of this
Country, that a horse requires 8 pounds of hay more
in 24 hours in an open & cold stable in the win-
ter, than he does in a stable that is close and
warm. I entice excitability of stimulus is always accom-
pany to be acting upon the system for its well
being, & of cold and a stimulus B, the more se-
vere it is, the less food should be necessary to keep
the system at its proper point of excitement.



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Do we not observe the same thing to take place in the inhabitants of cold & northern climates? They use a larger quantity of the most stimulating animal food & spirituous & fermented liquors, than the inhabitants of temperate & southern climates. The same thing is observed in warm & temperate climates in the different seasons. As in proportion to the coldness of the season in warm climates, so the severity of the cold in northern climates, do a man's own food & drinks more stimulating. Does this not arise from a deficiency of stimulants; & if cold was a stimulant, woud not the quantity of stimulating food & drinks be propor-
tional diminished in the same ratio in which the intensity of the cold was increased?—

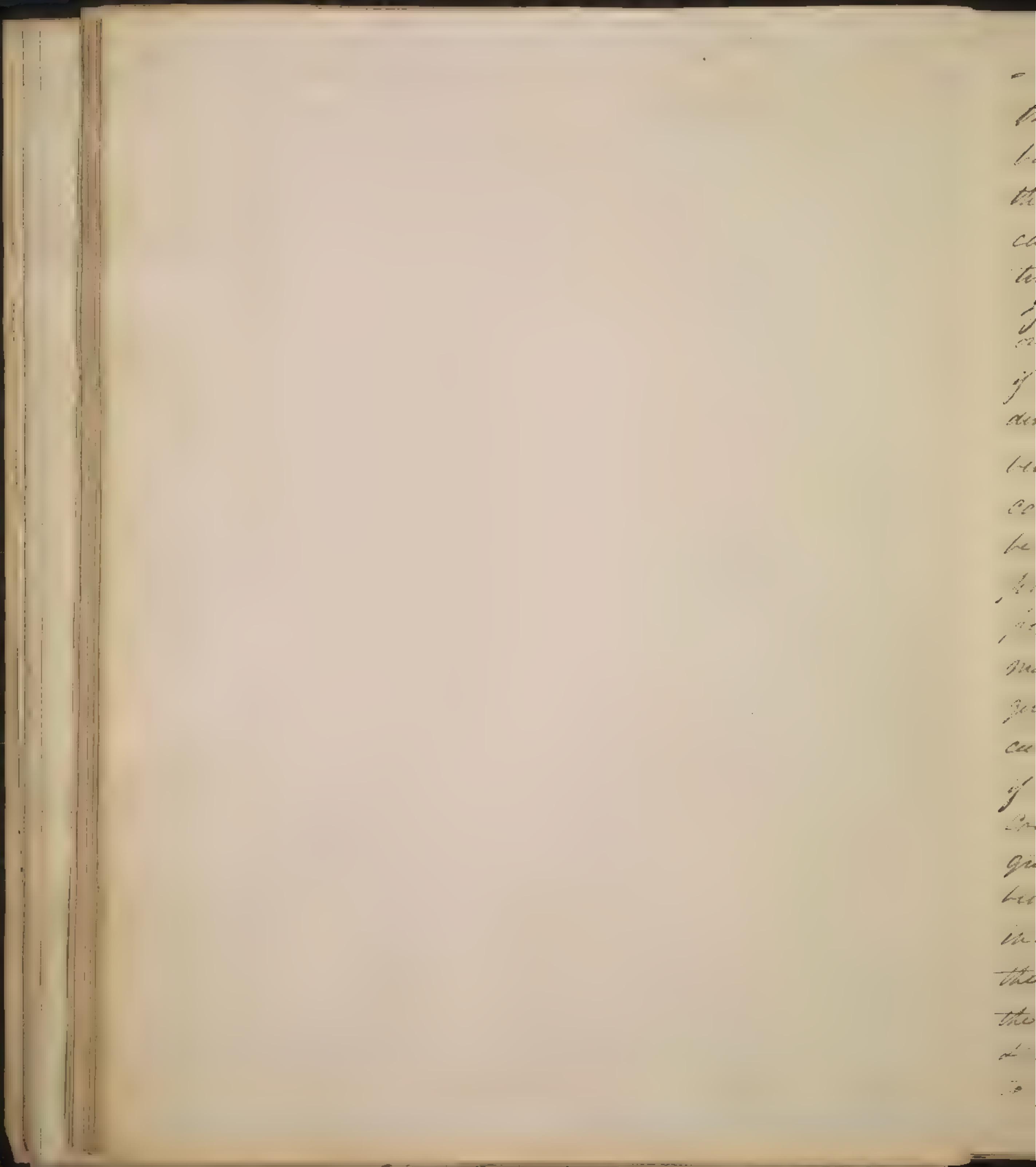
What is the cause of that difference of time which takes place in the appearance of the Catamenia in warm & cold climates? we have every reason to believe that in proportion as the Female has been under the influence of stimulating passions, con-
versations, food &c. and in proportion to the warmth of the climate, so much sooner do the Catamenia make their appearance. No very thing which facil-
itates repeated & uniform by the system, has a ten-
dency in the same ratio to accelerate the ap-
pearance of the Catamenia, under similar cir-
cumstances

Mr. Wm. Lee

Jeremiah

The
Lord

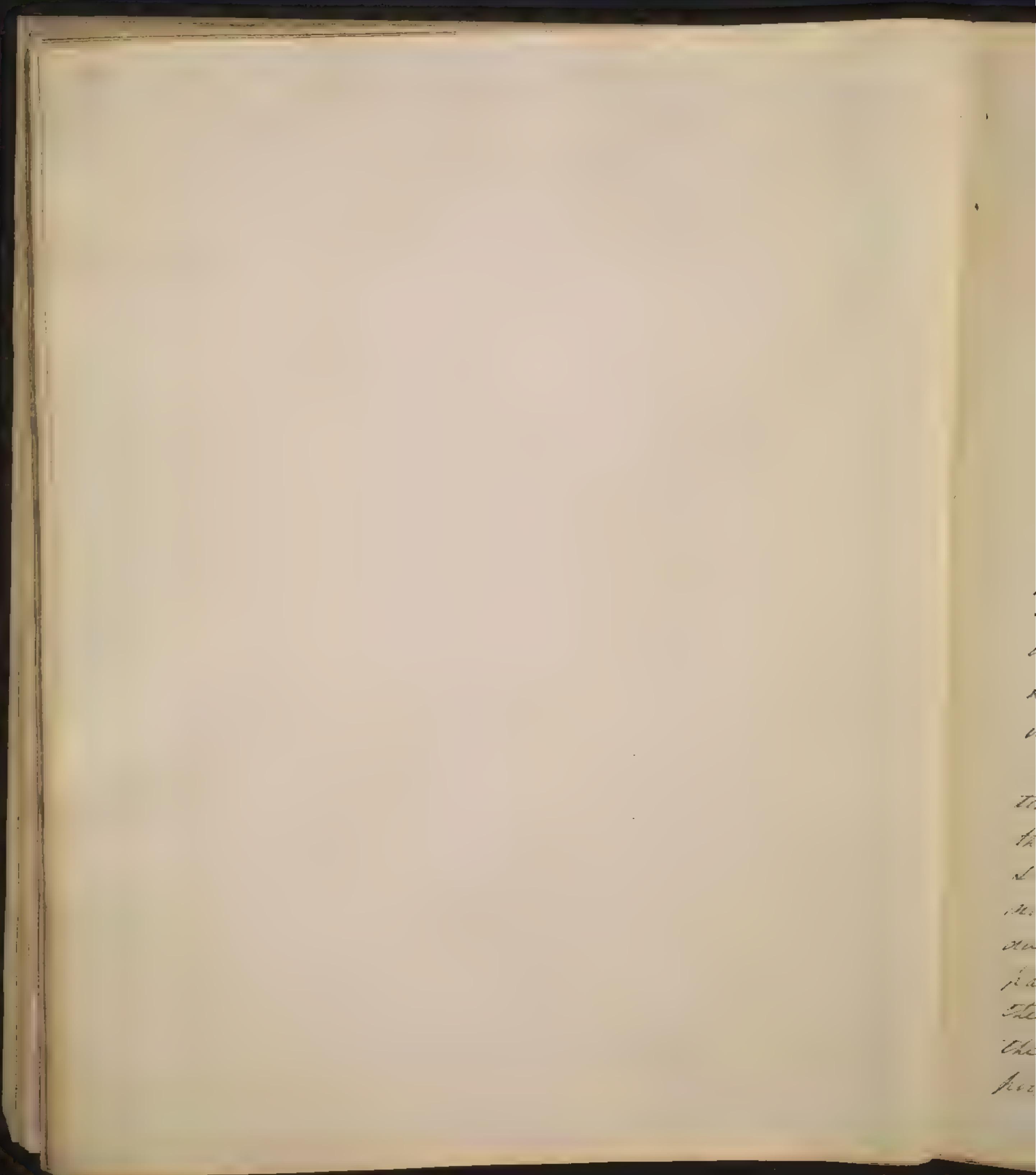
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- circumstances as to health, &c. In proportion to the degree of cold in very Climate, (cæteris paribus) so are the Catamenia retarded in making their appearance. Should cold then in this case be considered as a Stimulant or a sedative?

If the hand be exposed to cold for some time, or of a ball of snow or ice be applied to it, & if after a few minutes the hand then be suddenly exposed to a degree of heat which would have been comfortable before the application of the cold, a most excruciating & burning pain will be experienced. If the cold be increased, or its application longer continued, & the hand then be exposed to a greater degree of heat, besides the above mentioned symptoms, the part will be rendered of losing its life & sloughing off, or be inclosed by a great humor of inflammation. But if the hand thus exposed to cold, be plunged into cold water whose temperature is only a few degrees greater than that of the cold to which the hand has been exposed, & if the temperature then be gradually increased, the life of the part will then be saved, & the pain will be very trifling. It is evident that the irritability in this case is greatly accumulated, & that very gentle stimulants should be applied - Prevent violent morbid action, or new prostration &



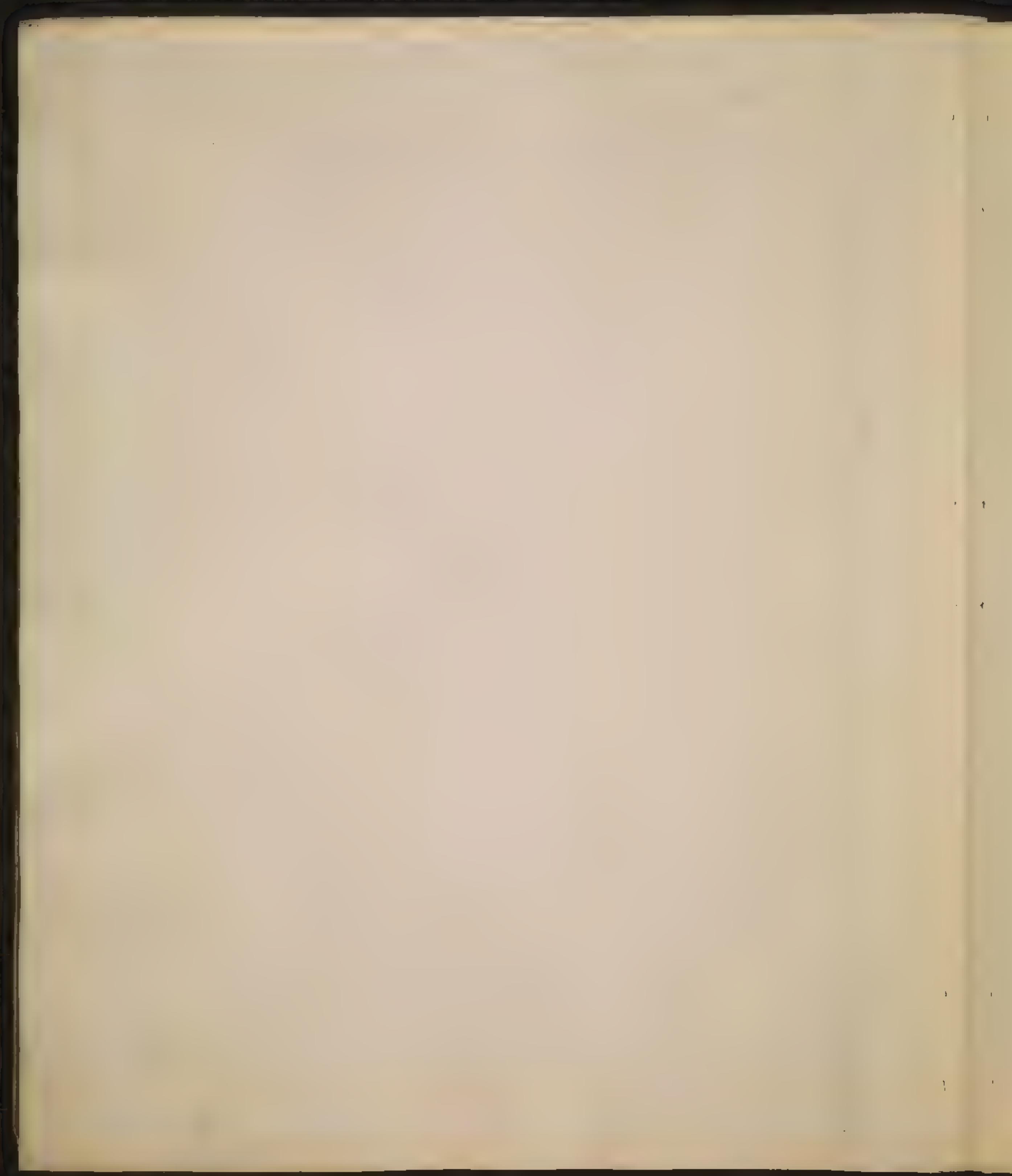
or death from taking heat; hence the treatment ¹⁴ in Frost-bites. If cold in the above case had acted as a stimulant, the excitability would have been exhausted instead of having been accumulated. The pain of the hand which is experienced from exposing it to heat after a previous application of snow or ice, appears to me to arise from a temporary or local Rheumatism of the hand. If cold be a stimulant, how shall we account for the frequency of Rheumatism, Pneumonia, Catarrh & other acute & inflammatory diseases in the winter & Spring, & from sudden changes of the weather? If the hand be exposed for some time to such a degree of heat as it can conveniently bear, & then be suddenly plunged into cold water, we shall have most of the symptoms as above mentioned, or in a very small degree.

Suppose a person to be in a room whose temperature was of such a degree as to be most agreeable to the person, to pursue the excitement of its natural & healthy functions, & causing neither fatigue by action nor abstraction; let the temperature of the room gradually reduce to such a degree that the life of the patient should be lost by his freezing; what would be the Pneumonia exhibited from the first reduction of the temperature of the room, till the death of the person? The natural excitement of the animal sys-



time would be gained, the heat of the body diminished, & the violent vital energy finally exhausted. We shall find no increase of excitement through this whole course, but a protracted symptom of a protracted natural quantity of stimulus acting upon the system. Suppose that after this cold has been considerably increased, it should be gradually reduced or abated, what would then take place? the excitability being accumulated by a sufficiency of stimulus, the natural heat of the body would then act as a powerful stimulant, the pulse would become excited, the heat much increased, & the skin would shew the inflammatory blush.

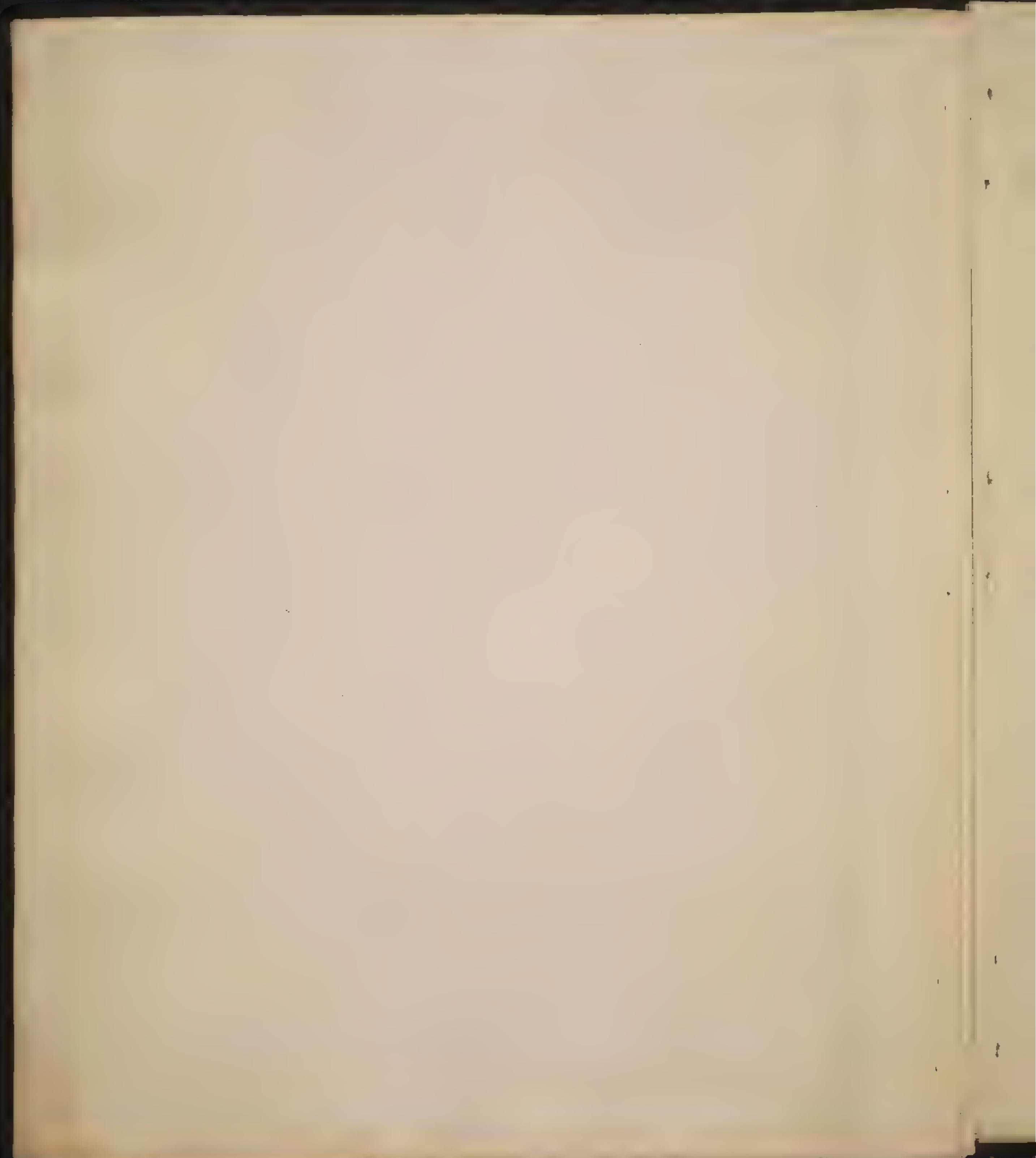
This must have been observed by many as in a specimen, who after exposing his face in walking to the fire in cold weather, suddenly turns his back cold, & takes a new road. All stimulants, unless applied gradually & at first in quantity or quality in which case immediate irritation or death may be produced increase the force of the arterial system & heat of the body; but we know that cold produces neither of these effects. Though it be increased from a very moderate to such a degree as to become extremely painful. This is proved by many experiments which have been made for that purpose, but which are needless for me to relate. If cold directly acts as a stimulant painlessly, I think it is difficult to conceive how any person could perish to death; before this could happen, the degree of cold



old would certainly arrive at such a point as to be a quiet time out, & would then increase the arterial circulation & consequently the heat of the body, thus prevent the person from freezing. But the contrary of this, I believe always takes place, the arterial circulation becomes more weak & feeble as long as the cold is applied & the heat gradually diminishes until the unfortunate victim is overtaken by the freezing arms of Death.

Now the action which takes place in the human in case of applying cold has been inferred that cold has a stimulant, but one of the strongest arguments in favor of the stimulating power of cold, for any stimulus which has a tendency to increase, instead of diminishing or destroying the quantity of stimulus, has a cold tendency to render this disease more fatal & difficult of cure. I feel confident in saying, that in a fit of apoplexy no one could with safety make use of stimulating exercise or continue his patient to a warm & close room. If then cold be an useful remedy in such cases, it must act by abstracting such a portion of stimulus as to permit the system to react & rule by any stimulating action of its own.

Now in some forms of disease has long been employed as one of the best remedies in local inflammation, when we would wish to check or stop inflammation & prevent suppuration, I think we would not

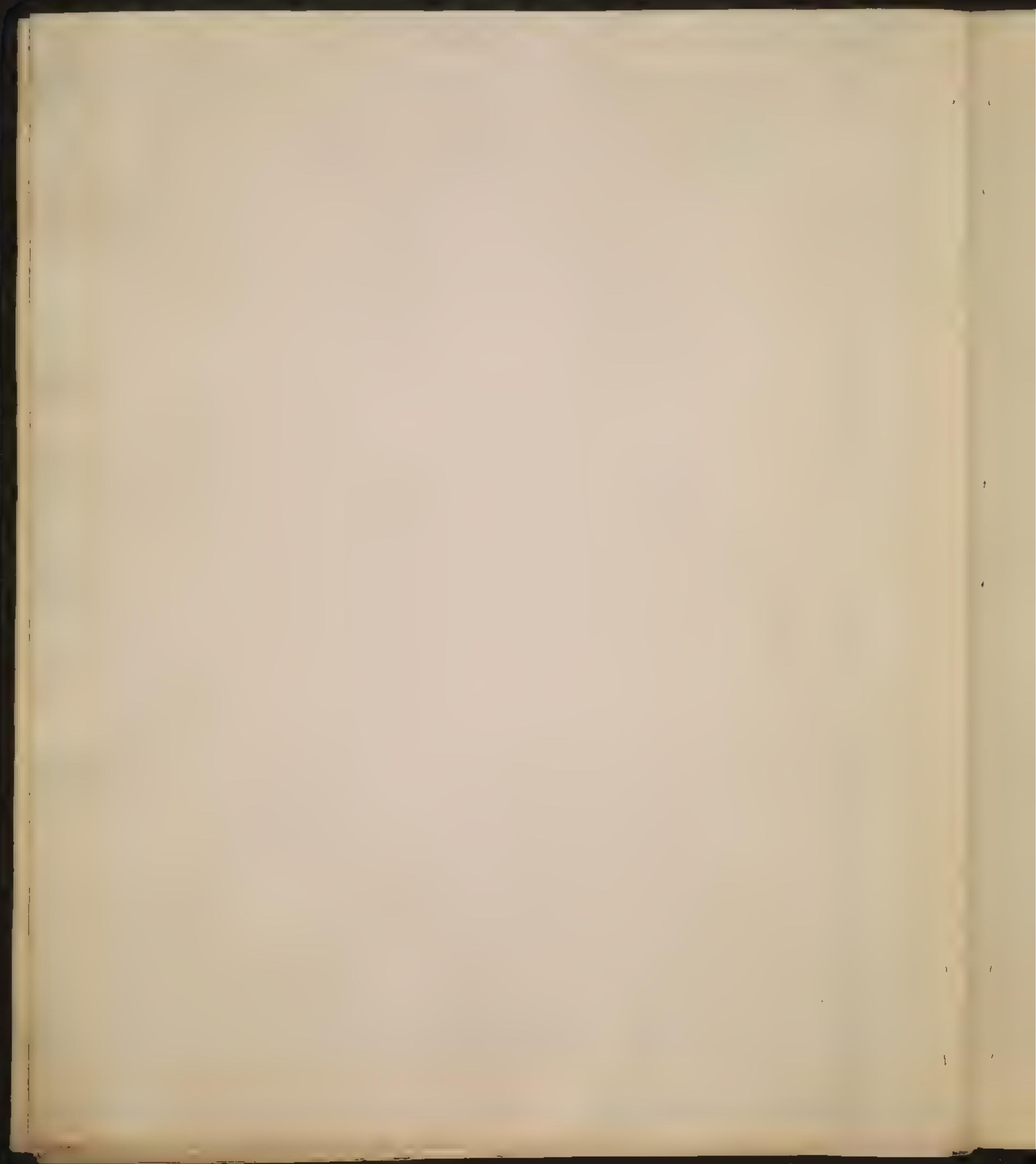


make use of stimulating applications. Of course it is a stimulant, I will confess that I am ignorant of the intention with which it is used in these cases.

The exacerbating pain, high delirium, restlessness, & watchfulness of Phenetics, are often relieved in a short time by cold applications to the head, or even by sharping the head, relief has been obtained; — It must be familiar to the younger medical student, that every thing which stimulates has a tendency to increase the disease, & that bloodletting, cold applications to the head, & every other aperient, are the proper remedies for it. But if cold acts as a stimulant in this case, it must be admitted that it acts entirely by a different from any other stimulant with which we are acquainted.

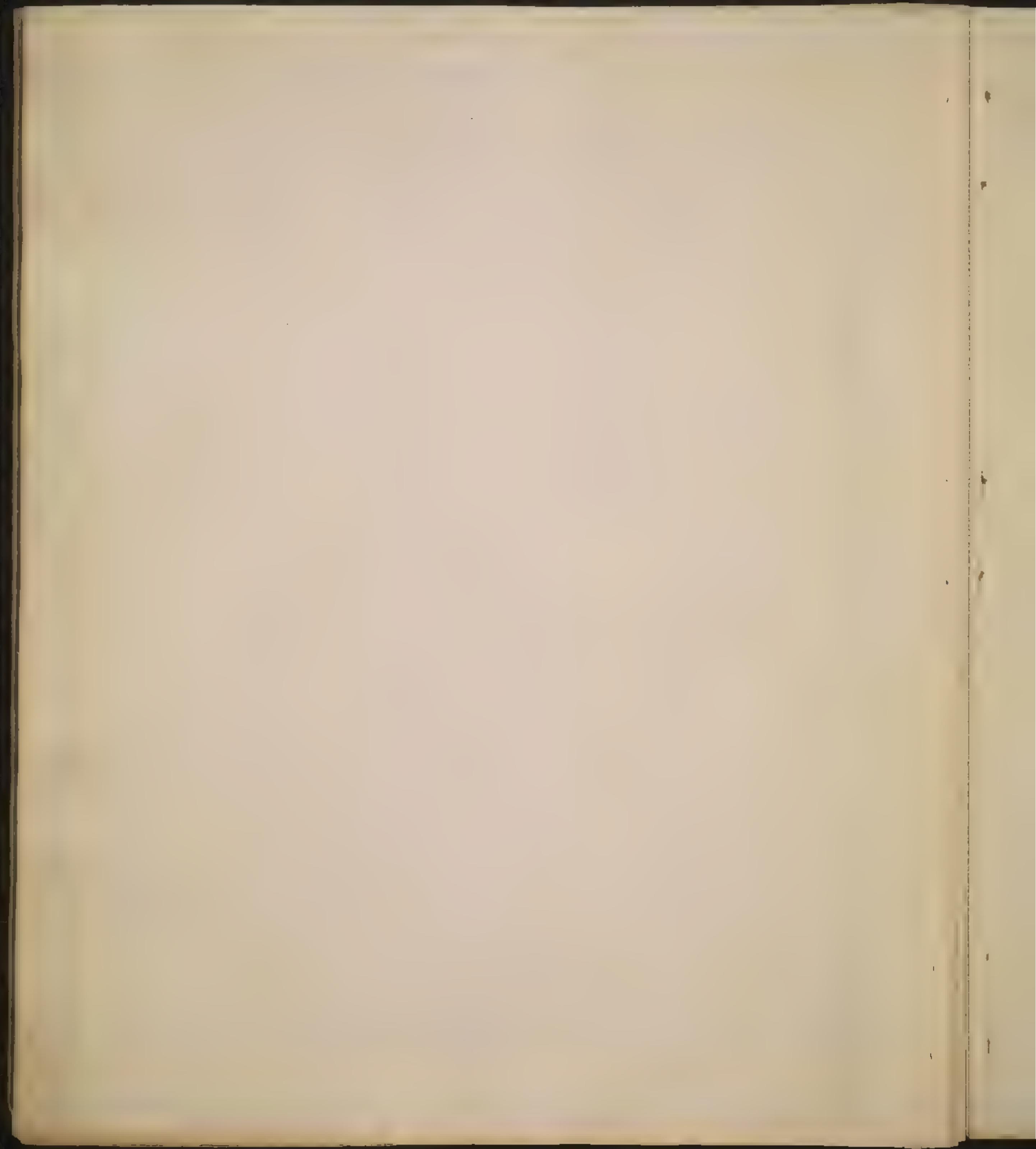
In all inflammatory fevers, as Small Pox, Measles, Rheumatism &c. cold in some shape or other is an invaluable remedy; but I would venture to assert that no one at this time would think of using stimulants in the inflammatory stages of these diseases. But every practitioner must have experienced the beneficial & healing effects of cold in febrile diseases of an inflammatory type.

The pain produced or arising from the application of cold, has been considered as a strong argument in favor of the stimulating power of cold; but from what I have said above, I think it is



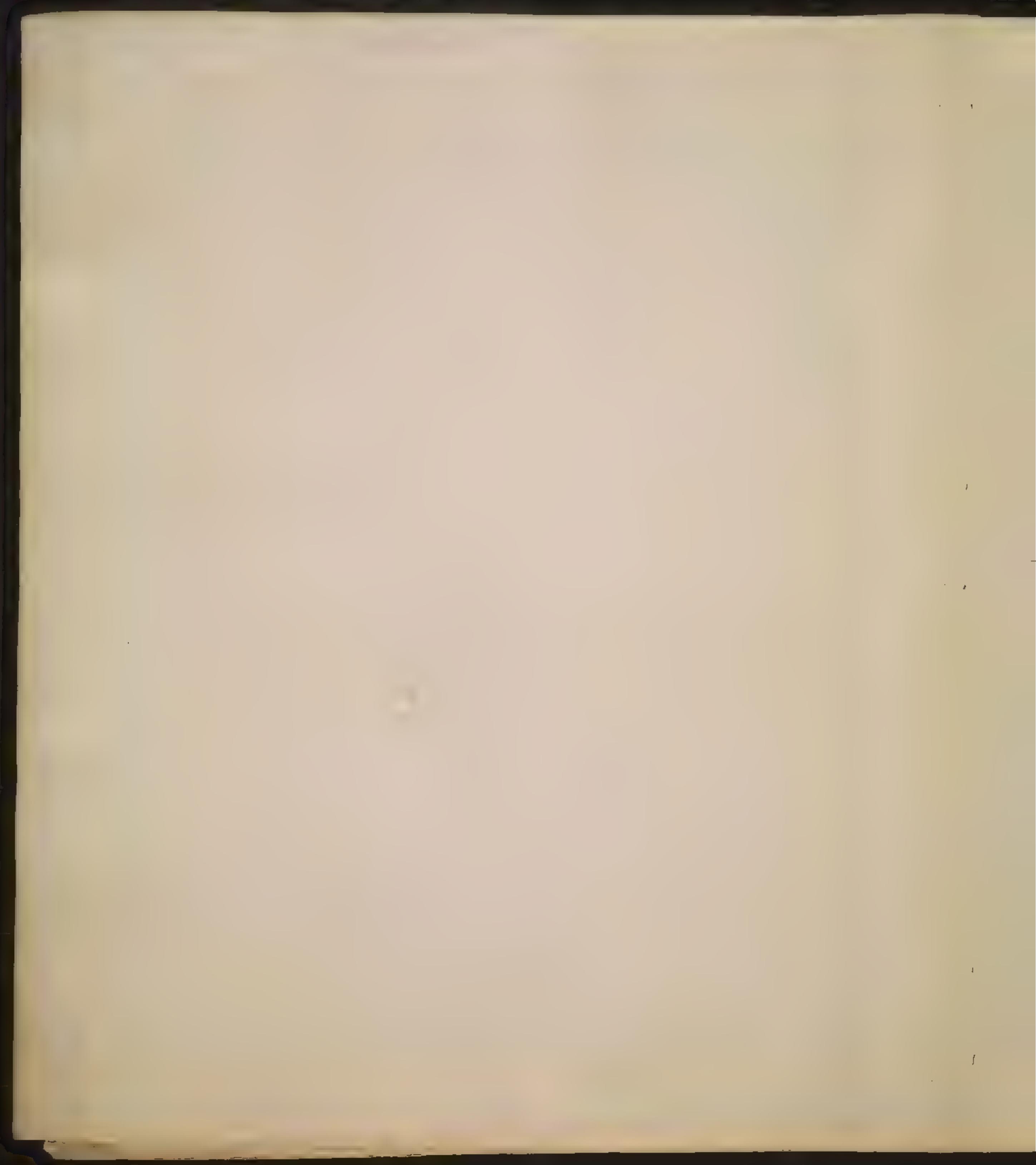
it wants that pain may arise from a deficiency as well as from an excess of stimulus, or to use the words of Dr. Rush, till the nerves are diverted from their proper action by the attraction of their proper stimulus & thus produce pain, in the same manner as we have seen arise from profuse blood letting.

Second. We know that heat always tends to an equilibrium, & that when cold has been applied to an external part, its temperature is diminished & its excitability accumulated; Now take the internal heat having a tendency to an equilibrium, & apply to this external part whose heat has been diminished & then acting upon its accumulated excitability, produce pain in the same manner as heat ultimately applies. This opinion derives some probability from pain being caused by such a degree of cold as is capable of suddenly reducing the heat of the part to which it is applied, & its application being so long continued as to destroy the equilibrium of the surface & the more internal parts; & that the pain ceases after the application of the cold has been continued long enough to bring the external & internal parts nearly in an equilibrium. That the cessation of pain does not depend upon an exhaustion of excitability & irritability is evident from the



the more ¹⁴ acute pain which is caused by approaching near a fire. This has been observed in cases of frost bites.

It is said that the flow of hair caused by the application of a ball of snow to the eye, is in part of the body being warm & cold. The hair arising from the heat, may be it that snow causes a small amount of the secretion of the hairs, but as we know that the whole external surface of the body is contacted by cold. the result of this apparently surprising & remarkable result, is that of the general contraction, which together with that state of torpor which must arise from such an application of snow proper degree of perspiration, & consequently a smaller quantity of hair must be abated. Thus the hair over-flowing the cheeks & surrounded of the contracted & shaking of the pores. Perceiving, give the appearance of an augmented quantity of hair; but that this does not affect any man's mind it is the action of the human glands, is inferred from all other glands having their action retarded or diminished by cold, induces the tale belief which the Obstetrician makes that a human & his small glands secreted at a time in cold climates, by a certain of cold, & it is found that perspiration is retarded by cold, & the secretion of the glands a prominent circumstance of a body in



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Cold water. Cold, for a few years past, has been much used by several Physicians in Europe in Typhus fever, & has afforded a strong argument as thought by some, of the stimulating power of cold, but I think militates against the opinion which it was intended to support. In what state of Typhus fever is cold used, & in what manner is it employed? It has been thought most beneficial when the skin was hot & parched. It must be evident to every one that the dry & hot skin in this case must depend upon an increased & morbid excitement; now if this dangerous excitement can be transferred to the arterial system by a number of ways, we shall obtain the same effects as by giving large doses of stimulants internally. With this intention cold water has been used, hence the necessity of the application of cold being continued a very short time in Typhus fever. If cold is a stimulant, why is cold water used only in the manner of affusion in Typhus fever? if it was a stimulant, would it not be better to let the patient bathe for an hour or two in a tub of cold water, or if this method was inconvenient, to make cold applications to the extremities for some length of time, for we know that the most powerful stimulants are most useful in Typhus fever. If it is continued for a considerable time

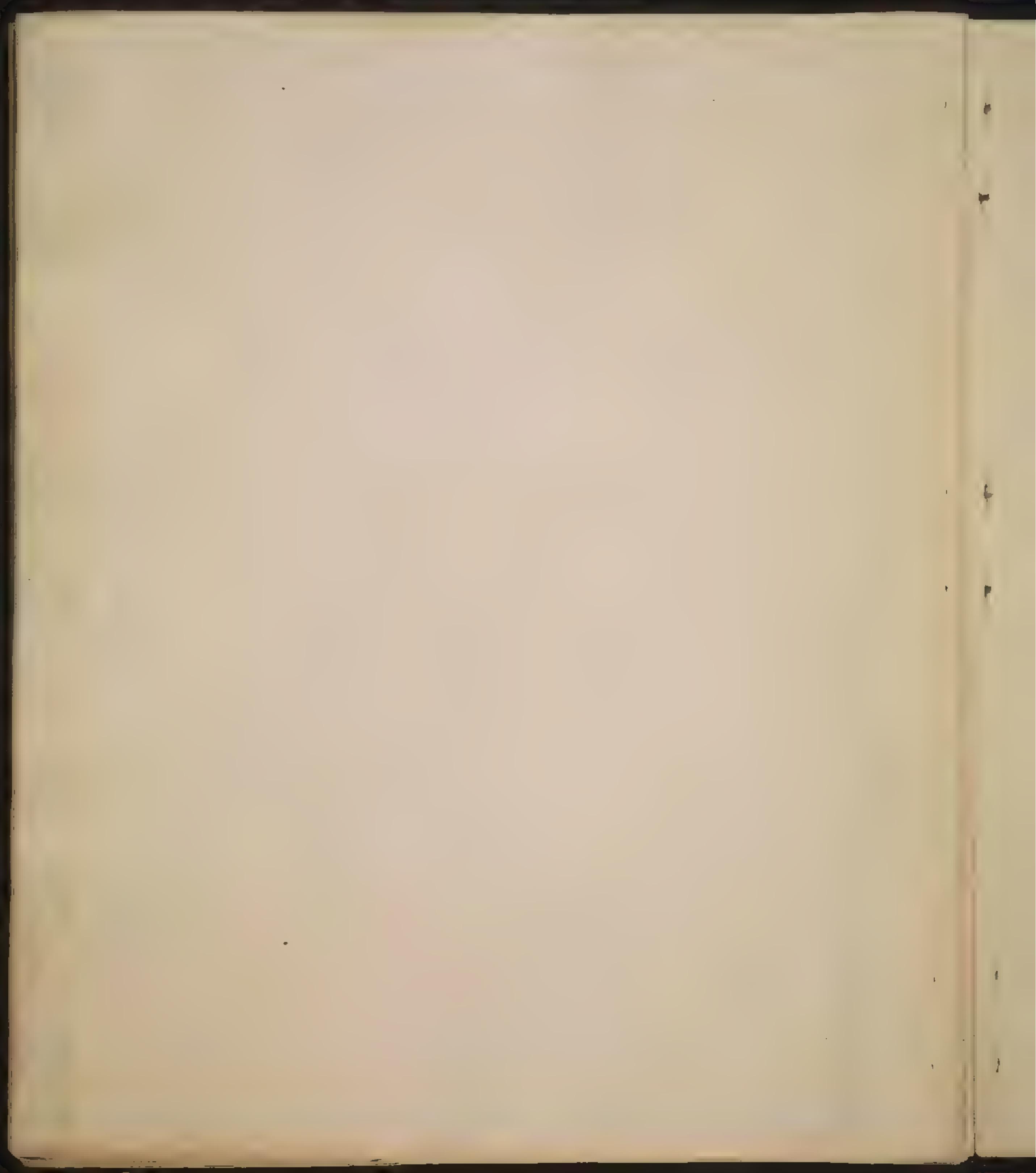


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general excitement of the system would be destroyed & death would be the consequence. From this it appears that no directly stimulating effect is obtained from the cold, & that is no power who would expect to find the force of the circulation increased, as long as the application of the cold is continued in this manner. It is only after the application of the cold has been discontinued & the system has time to react, that we experience any of the stimulating effects of cold.

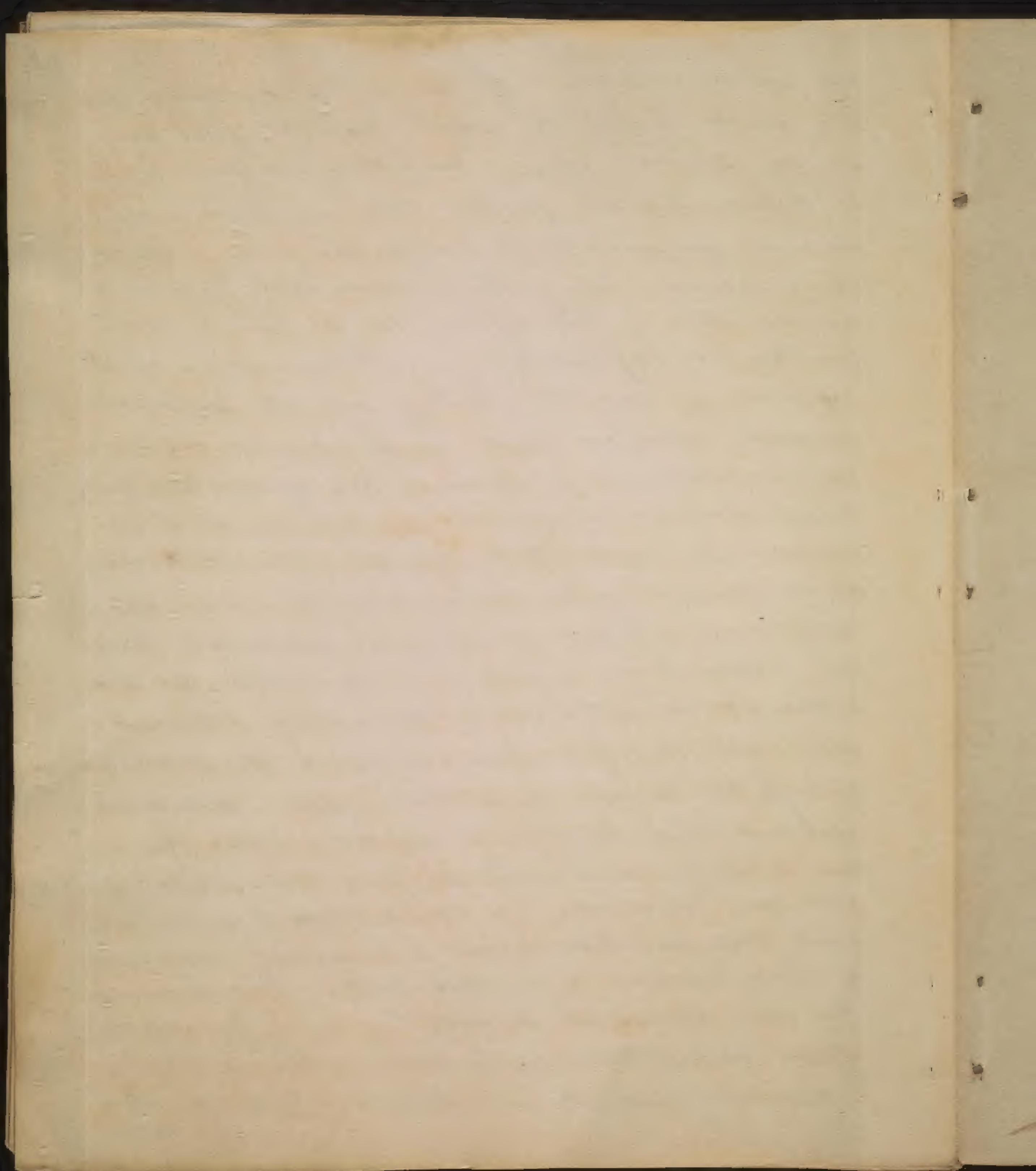
From similar effects being produced by cold and certain stimulants, cold has always been supposed to be a stimulant; but these similar effects have been produced when the system has been in very different circumstances or different conditions; for instance, the two salts of opium both increase perspiration, & as opium is known to be a stimulant so must be the cold bath as it produces the same effects as opium. But when we know that these similar effects are produced in different states of the system, it must be evident that they produce these similar effects by a dissimilar mode of action. We know that cold produces this effect only when the system is excited above par considerably; & I can venture to say that no one would give opium or any other stimulant to produce or promote sweating, when the system





was much excited. If we are to conclude that two articles possess the same properties from producing similar effects, Blood letting & opium should be clasped together, for they both ease pain, promote sleep & perspiration & increase the force of the animal action; but if they produce these effects in dissimilar states of the system, can we have a doubt but they act dissimilarly? — I think it is a sound axiom in Medicine, that if different substances produce similar effects under similar circumstances, circumstances, or states of the system, that their powers, properties or qualities are similar, & vice versa. We know that opium & venesection produce similar effects under very dissimilar circumstances, & that opium is a stimulant, therefore venesection must be a sedative. But Cola & venesection both reduce the activity of the pulse when not oppressed, give activity to the pulse when oppressed, increase perspiration & put a stop to hemorrhages when the animal system is excited; thus under similar circumstances we find that similar effects are produced by venesection & Cola. We know that venesection is not a stimulant, consequently Cola cannot be a stimulant. Does opium or any other stimulant produce any one of the above effects under the same state of the system? —

Cola is said to give strength & vigor to the body,



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body; and do we do it unless the system has
been oppressed by heat? & does it not then do its
mischief by abstracting a portion of the superabun-
dant stimulus of heat which irritates the sys-
tem & thus causes it to react? -

The various accounts of the benefits derived from
Cola in the most inflammatory diseases, leave no
room to doubt of the sedative power of Cola.
How do the advocates for the stimulating power of Cola
account for the beneficial effects of Cola in these in-
flammatory diseases? They say, "When employed as a rem-
edy in these diseases, Cola though a direct stimulus to
the skin to which it is applied, acts indirectly as
a sedative to the arterial system. First, it trans-
fers to the skin somewhat on the principle of blister-
ing plasters, a degree of excitement which the organ
does not before possess; & secondly, it acts the part of an
vacuum. For it is the genuine vacuum of heat of
which there is a preternatural & morbid accumulation
in the systems of those laboring under pestilential dis-
eases. Its evacuation, therefore, or removal from the sys-
tem, must be attended with a sedative effect."

If the removal of the heat of the system be attended
with sedative effects, must not whatever removes
the heat be a sedative? - that is pestilential &
highly inflammatory fever is a great irritant to the
system, & though itself be the effect of the morbid ac-
tion of the system, it becomes an irritant & keeps up

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